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(54) Mounting means for removable container

(57) Apparatus with a tubular socket 28 which receives in seating relation the neck 15 of a container 10, is movable upwards from a stop 23, and extends to the liquid level when in service, so that on removal of the container the tubular socket is moved upwards off the stop to break the liquid connection before the container separates from the socket whereby liquid around the container mouth 16 at separation falls back into the socket.

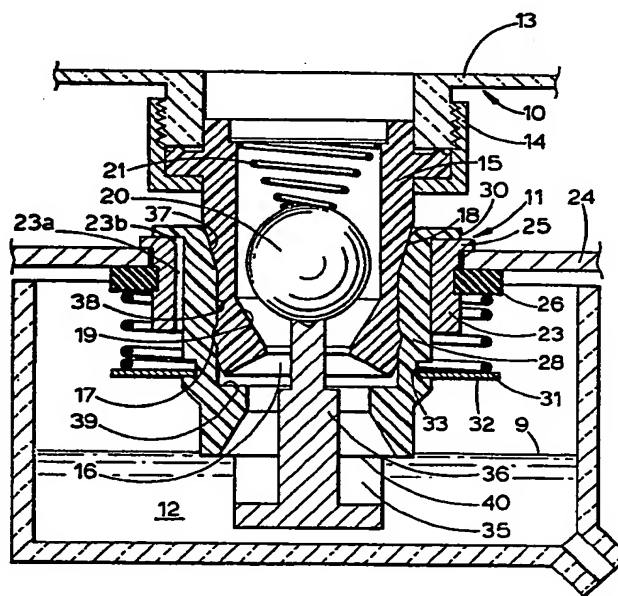


Fig. 1

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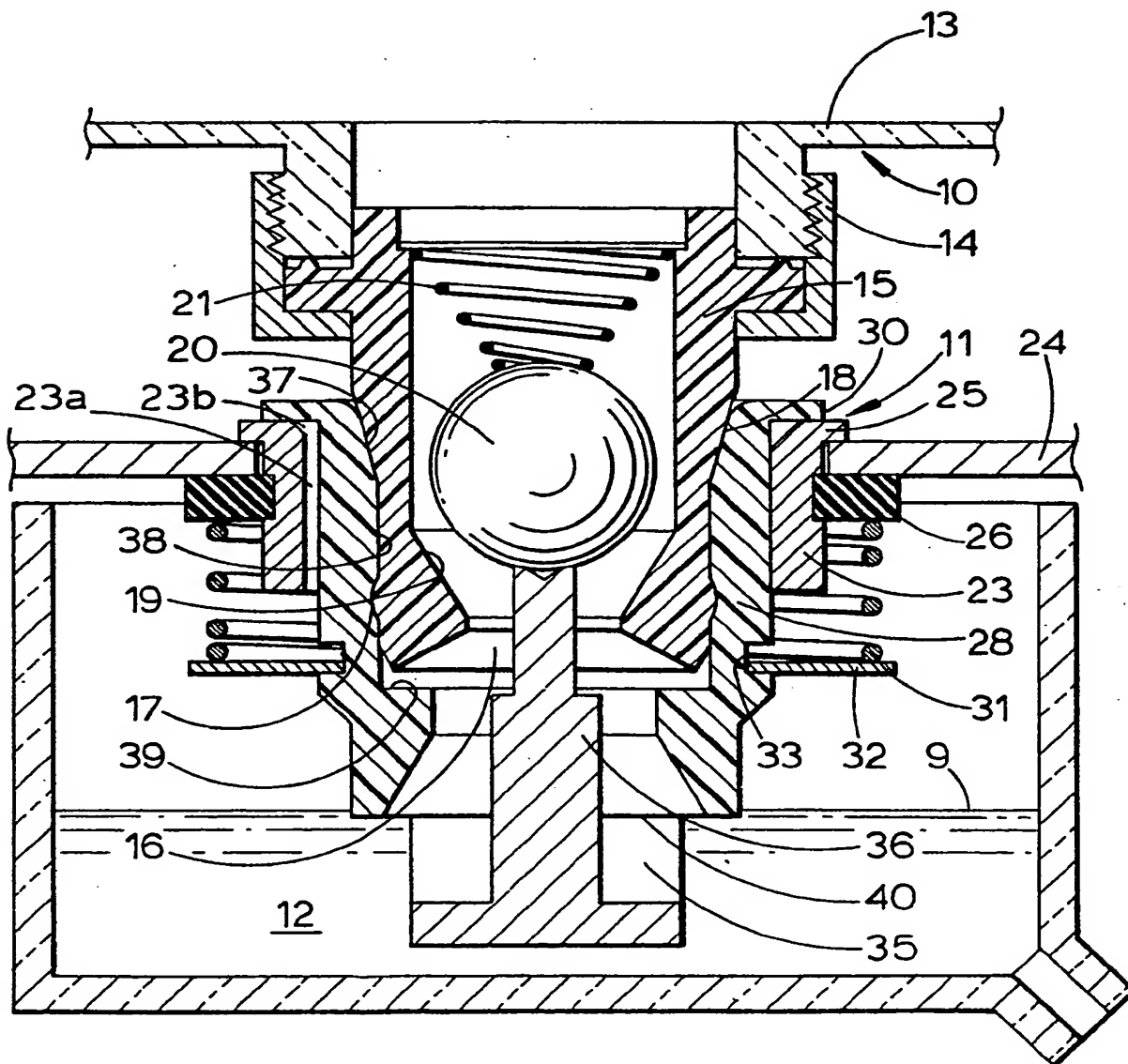


Fig. 1

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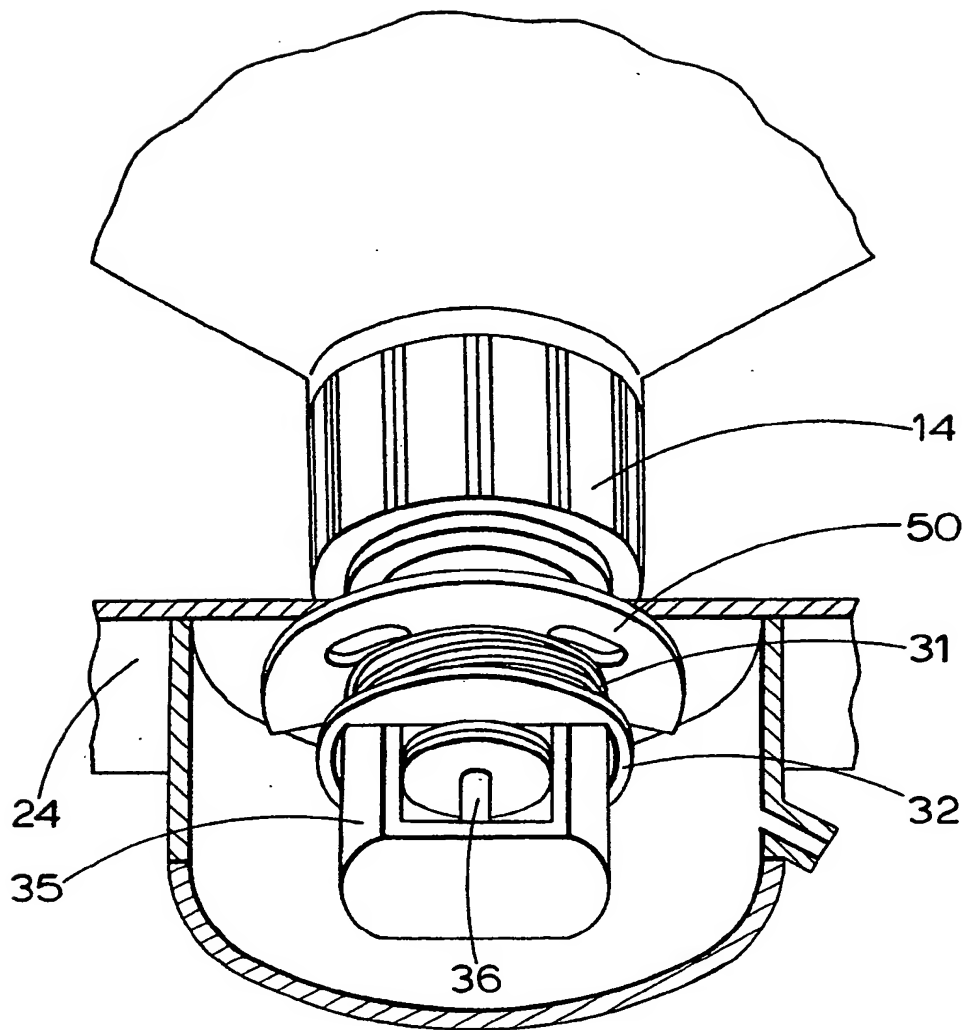


Fig. 2

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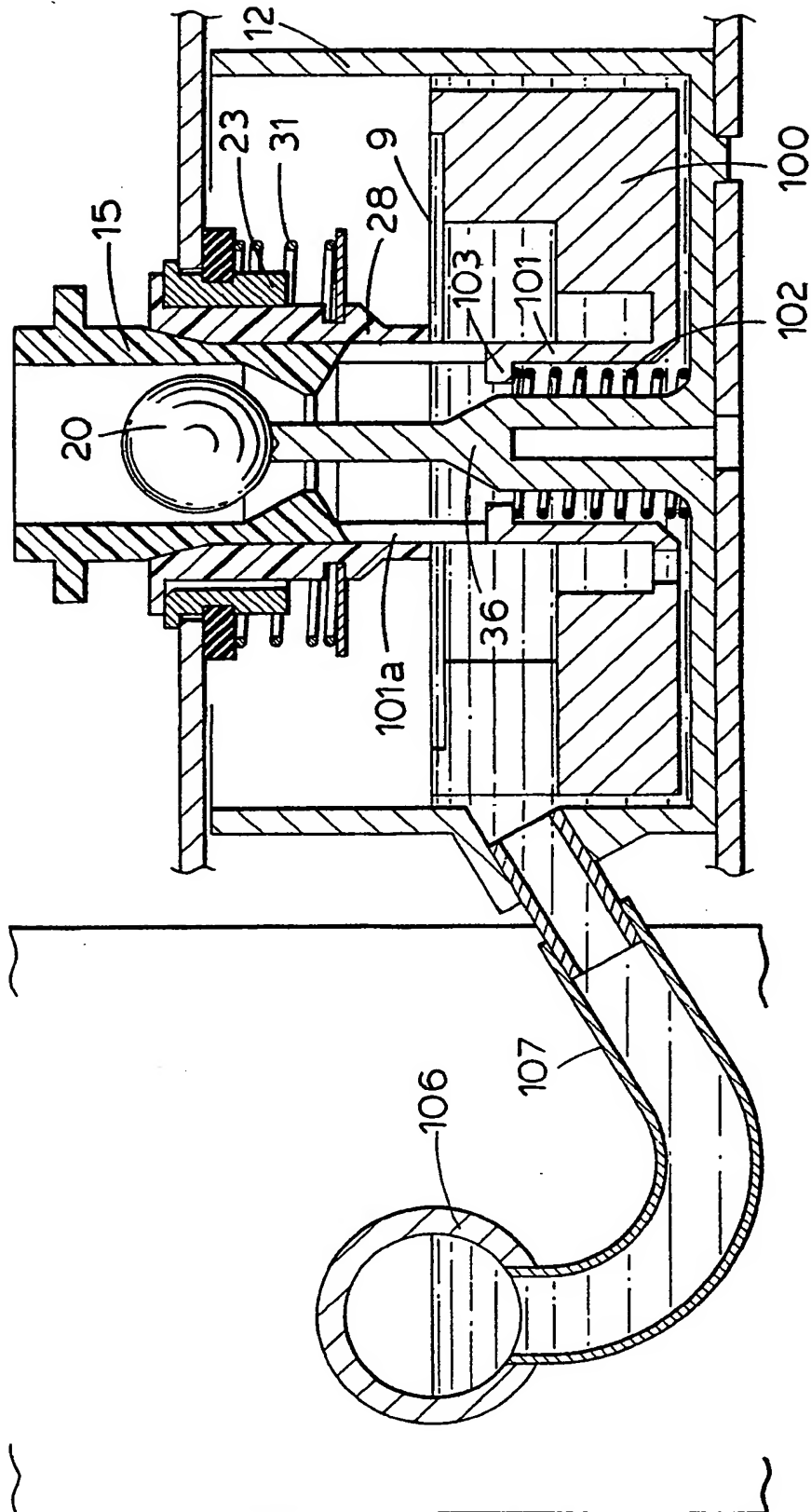


Fig. 3

## SPECIFICATION

## Mounting means for removable container

5 This invention relates to apparatus wherein a liquid level is maintained by a replaceable container which in service is inverted and in communication with the liquid.

10 In apparatus of the kind described where the liquid is inflammable or corrosive it is most desirable that it should not be spilt, even to the extent of a few drops.

The container may be provided with a closure urged to the closed position and opened only when in position on the apparatus. One example of such a container is illustrated in U.S. patent 1,538,483. It has been found that this does not completely avoid spillage. Especially when the container is removed from the apparatus drops may be sprinkled about and even one or two drops may be objectionable.

20 In an endeavour to mitigate the problem referred to, the invention provides apparatus with a tubular socket which receives in seating relation the neck of a container, is movable upwards from a stop, and extends to the liquid level when in service, so that on removal of the container the tubular socket is moved upwards off the stop to break the liquid connection before the container separates from the socket whereby liquid around the container mouth at separation falls back into the socket.

30 Preferably the socket is spring-urged on to its stop. Preferably also the socket and container neck cooperate in their assembled position to enable upward force on the container to lift the socket against the spring.

In the accompanying drawings:

35 Figure 1 is a sectional view of a portion of an apparatus embodying the invention illustrated by way of example;

Figure 2 is an isometric view of the apparatus from below, shown with a slight modification, and

40 Figure 3 shows a construction similar to Figure 1, with an additional feature.

Referring to Figure 1 of the drawings, the apparatus there shown requires liquid to be maintained at a level indicated at 9 in a reservoir 12. An airtight bottle 10 containing the liquid is provided for this purpose, removably mounted on means shown generally at 11 over the reservoir.

The bottle 10 has a polypropylene body 13 to which is secured, by a threaded ring 14, a neck 15 of elastic plastics material defining a mouth 16, a shallow external bead 17 around the mouth, a frusto-conical shoulder 18 remote from the mouth, and a conical valve seat 19 within the mouth. A soft plastic ball valve member 20 is urged by a spring 21 on to the seat 19 and normally seals the bottle.

The mounting means 11 comprises a tubular support body 23 fixed to a rigid horizontal plate 24 forming part of the apparatus. The body 23 extends through a hole in the plate 24 and has a flange 25 seating on top of the plate around the hole. As shown in Figure 1, a sealing ring 26 is located in a groove on the outside of the support body 23 and exerts pressure on the underside of the plate 24 to hold the body firmly in place and provide a seal between the body and the plate. A generally tubular socket member 28 of

some what elastic plastics material is a sliding fit in the support body 23. A flange 30 on the upper end of the socket member 28 seats on the flange 25 of the support body 23 which forms a stop to define the bottom or normal service position of the socket member. A compression spring 31 surrounding the support body 23 acts between the underside of the ring 26 and an abutment plate 32 sprung into a groove 33 on the socket member 28, to urge the socket member to its bottom position.

The body 23 is internally slotted as shown at 23a and chamfered as shown at 23b to avoid upward movement of splashed liquid by capillary action between the body 23 and the socket 28.

80 A yoke 35 depending from the support body 23 supports a post 36 extending axially up through the socket member 28.

The socket member 28 has within it a frusto-conical seat 37 at its upper end and a cylindrical bore 38 terminating at an internal shoulder 39. The socket member 28 extends downwards to a mouth 40 which when the member is in its bottom or normal service position is at the liquid level 9.

When it is desired to assemble a bottle 10 with the mounting means, the neck 15 is pushed into the socket member 28 until the frusto-conical shoulder 18 on the neck seats on the frusto-conical seat 37 in the socket member. As soon as the bead 17 around the mouth 16 of the bottle engages the cylindrical bore 38 of the socket member 28 a seal is formed. As the bottle neck 15 moves on downwards, the post 36 engages the ball valve member 20 to move it off its seat 19. Thus, when the bottle neck 15 reaches its final position in the socket member, as illustrated, the interior of the bottle is open and in communication with liquid in the reservoir 12. As the liquid level falls, the contents of the bottle replenish the reservoir 12 to restore the liquid to the desired level.

When the bottle 10 is empty it is removed. Lifting the bottle 10 moves the socket member 28 upwards against the spring 31, by reason of frictional engagement of the bead 17 with the bore 38. When the abutment ring 32 engages the bottom end of the support body 23 the socket member 28 can rise no further and the bottle neck 15 starts to withdraw from the socket member. Before this the ball valve member 20 will have seated on its seat 21, so that on withdrawal the bottle is sealed.

Lifting the mouth 40 of the socket member 28 from the liquid level 9 enables all liquid within the socket member or around the mouth 16 of the bottle to fall down into the reservoir before the bottle is finally withdrawn from the socket member. In prior arrangements using a fixed socket there has been a tendency for drops to be carried up as the bottle is removed, these drops later falling on the apparatus. The arrangement described avoids this.

Figure 2 illustrates the same construction as described with reference to Figure 1, with the exception that instead of the sealing ring 26 a C-clip 50 is sprung into a groove on the member 23 to hold the socket arrangement against the mounting plate 24. The spring 31 abuts the C-clip.

Figure 3 shows a construction similar to Figure 1, with a movable fluid displacement member in the

reservoir to provide extra liquid storage capacity. Parts similar to those of Figure 1 will be designated by the same reference numerals and will need no further description.

- 5 In the Figure 3 embodiment the yoke 35 is dispensed with and the port 36 is integral with the plastics moulding which forms the reservoir and extends upward from the bottom thereof. A buoyant displacement member designated generally 100 occupies a major part of the volume of the reservoir 12 below the liquid level 9. A central tubular member 101 forming part of the displacement member 100 extends upwards within the socket member 28 and has its upper end abutting the bottom end of the bottle neck 15. The 10 member 101 is slotted at 101a from the top to allow free communication with the area below the bottle neck 15. A compression spring 102 surrounding the port 36 and abutting the bottom of the reservoir acts against an inwardly extending flange 103 on the 20 central tubular member 101 to urge the member upwardly.

A liquid dispenser is illustrated generally at 106 and is connected by a tube 107 to the reservoir below the level 9.

- 25 With the apparatus in normal service, the bottle has its neck 15 in the socket 28 and this holds the displacement member 100 down against the spring 102. When the apparatus is to be moved, the bottle is taken away. This allows the spring 102 to raise the 30 displacement member 100 so as to increase the volume available for liquid in the reservoir. Liquid in the dispenser 106 and reservoir 107, or at least some of it, can then drain back into the reservoir 12 and there will be less danger of spillage when the apparatus is 35 moved.

It will be seen that so far as the bottle is concerned, the Figure 3 construction works in the same way as that of Figure 1.

- The arrangements illustrated were devised particularly for a spirit addressing machine, where (in Figure 40 3) the dispenser moistens the surface of an envelope or the like, to receive an image from an address card. The invention will be seen however to have a broader application.

#### 45 CLAIMS

1. Apparatus with a tubular socket which receives in seating relation the neck of a container, characterized in that the socket is movable upwards from a stop, and extends to the liquid level when in service, 50 so that on removal of the container the tubular socket is moved upwards off the stop to break the liquid connection before the container separates from the socket whereby liquid around the container mouth at separation falls back into the socket.

- 55 2. Apparatus as claimed in Claim 1, wherein the socket is spring urged to its stop.

3. Apparatus as claimed in Claim 2, wherein the container neck has a ridge to assist in forming a seal with the socket and in enabling upward force on the 60 container to lift the socket against the spring.

4. Apparatus as claimed in Claim 1, comprising a tubular support body to be mounted stationary on a reservoir, a socket member guided for vertical movement by the support body between an upper and a 65 lower position defined by lower and upper stops on

said member, the socket member providing said tubular socket, a spring acting between a stationary part and the lower stop to hold the socket member in its lower position in normal operation, the socket member having at its lower end a mouth for discharge of liquid from the container to the reservoir, the socket member and container neck cooperating to enable upward force on the container to lift the socket member with it to the upper position thereof and then 70 to release the container.

5. Apparatus as claimed in Claim 4, wherein the support body carries means extending through the mouth of the socket member to dislodge a stopper within the container mouth.

- 80 6. Apparatus as claimed in Claim 4, wherein the reservoir carries an upstanding member extending through the mouth of the socket member to dislodge a stopper within the container mouth.

7. Apparatus substantially as herein described 85 with reference to the accompanying drawings.

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